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DESCRIPTIONS OF NEW COLUBRID SNAKES, GENUS *ATRACTUS*, FROM ECUADOR

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During the past few years I have been engaged in a revisional study of the Ecuadorian snakes of the genus *Atractus* Wagler, 1828. This analysis, based on an examination of approximately 350 examples about 250 of which were from Ecuador, is now near completion but as publication may be delayed it seems advisable to present preliminary diagnoses of the new forms. Acknowledgments for aid and material and a detailed discussion of the species and their affinities are reserved for the larger work.

The five species described in this paper belong to the *trilineatus* group of the genus. The group is characterized by non-capitate hemipenes, long loreal, small rostral, small internasals and large prefrontals. Forms having either 15 or 17 rows of dorsal scales occur in this section of *Atractus* but it seems likely that the forms with 15 scale rows have been derived from species with 17 rows. The color pattern of *trilineatus* and its allies is primitively of dark longitudinal stripes on a lighter ground color but many populations exhibit a tendency toward melanism and the color of these forms is of nearly uniform dark brown, gray or black. The species group has a wide range in South America and at least 25 names have been applied to members of the stock. Only two of these names appear to be applicable to Ecuadorian striped *Atractus*.

Since all the new forms described here are representatives of the *trilineatus* complex certain of them may eventually prove to be subspecifically allied either to one another or to extra-limital forms. Available information, especially regarding non-Ecuadorian *Atractus*, does not permit adequate exploration of this possibility and it seems best under the circumstances to regard each distinct population as a separate species.

Since the snakes described below are the only striped members of the *trilineatus* group besides *Atractus duboisi* Boulenger, 1880 and *Atractus collaris* Peracca, 1897, known from Ecuador, a provisional key for the identification of Ecuadorian members of this section is presented at the end of the paper.

Throughout this report where more than one specimen is at hand counts and measurements are given as follows: 1-2-3 (2.5). In this style of notation the figure in parentheses is from the holotype, the first figure indicates the lower limit of the variational range in the paratypes, the second number the arithmetic mean of the paratypic series and the

third figure the upper limit of the range of variation in the paratypes.

Abbreviations represent the following collections: American Museum of Natural History (AM); British Museum of Natural History (BM); Chicago Natural History Museum (CM); Escuela Politecnica Nacional, Ecuador (EP); Museum National d'Histoire Naturelle, Paris (PM); Museum of Zoology, University of Michigan (UM); Natural History Museum, Stanford University (SU).

Atractus gaigeae, new species

Rhabdosoma maculatum Bocourt, 1883 (part), p. 540, pl. 35 fig. 1.
Atractus bocourti Boulenger, 1894 (part), p. 306.
Holotype: UM 82887, a male from Santiago-Zamora Province, Ecuador. Collected in the summer of 1935 by Clarence Altenberg and Bancroft G. Butler.

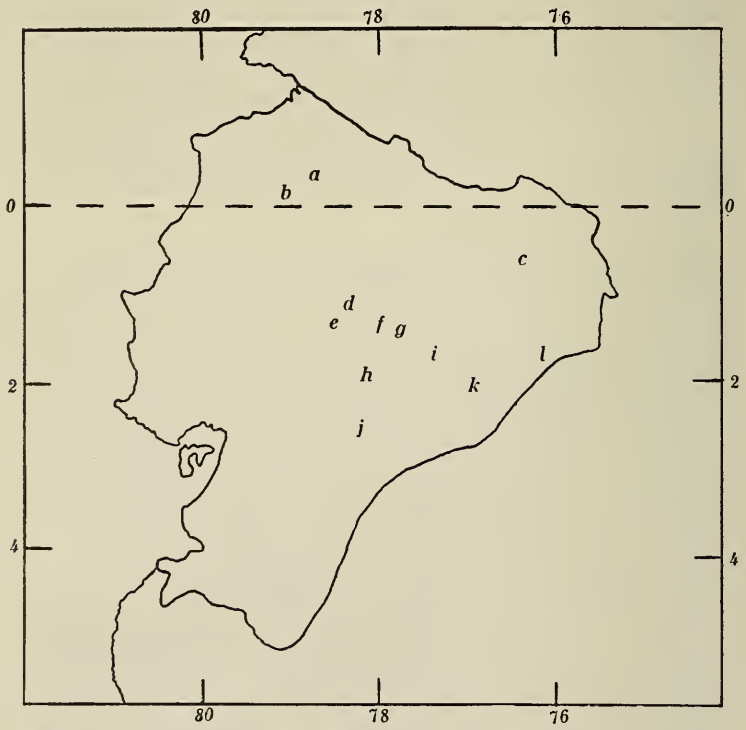

Fig. 1. Map of Ecuador showing position of localities mentioned in text. a. Intac, b. Mindo, c. Loreto, d. Llanganate, e. Baños, f. headwaters of Rió Bobonaza, g. Canelos, h. Paitanga, i. Sarayacu, j. Sucua, k. Chicerota, l. Rió Cononaco.

Paratypes: Also available are six paratypes from Napo-Pastaza Prov-

ince, Ecuador: between Baños and Canelos (AM 35891, a male); headwaters of the Rió Bobonaza (SU 15621, a male); Canelos (SU 15619, a female and SU 15620, a male); Sarayacu (EP 48, a male); Chicherota (EP 46, a female).

Diagnosis: A form most closely resembling *A. collaris* Peracca, 1897, of Peru and Ecuador and the Ecuadorian forms *A. ecuadorensis, A. occidentalis* and *A. dunni* described in this paper, but distinguished from these forms and other members of the genus in Ecuador by: 1) dorsal scales in 17 rows; 2) loreal between two and three times as long as postnasal; 3) teeth on maxillary 5-6; 4) ventrals in males 189-191-198 (192), in females 207-210-213; 5) pattern of seven dark stripes and two rows of regularly arranged dark spots.

Lepidosis: Rostral smaller than a prefrontal, pentagonal. Internasals much less than half as large as prefrontals; a little broader than long. Prefrontals longer than broad. Postoculars two. Temporals 1+2. Supralabials seven, third and fourth in eye. Infralabials six, usually three (rarely four) meeting a chin shield on each side. Caudals in males 35-37-39 (37), in females 25-26-27. Ventrals plus caudals 222-228.5-240 (236).

Hemipenes: Organ bifurcate at tip, covered with spines for complete length; largest spines in region of sulcus division, decreasing in size distally and proximally. Several small basal plicae mounted with minute hooked spines. A well-developed lateral fold or pocket extending from plicate area to level of fourth or fifth caudal, naked. This pocket lies opposite the sulcus spermaticus. Sulcus divided at seventh caudal. Hemipenes reaching to level of 11th or 12th caudal.

Coloration: Dorsal ground color brown and imposed upon it are seven dark longitudinal lines or stripes: a vertebral stripe, a single scale row wide; a pair of lateral stripes on the lower half of third and upper half of second scale rows; a pair of ventral stripes on upper edges of ventrals and lower half of first scale row; and between the ventral and lateral stripes on each side, restricted to the upper margin of the first and lower edge of second scale rows, an irregular lateroventral stripe. Between the vertebral and lateral stripes are a series of regularly arranged obscure dark dorsolateral blotches. A dark brown area on neck continuous with lateral brown stripes, bordering the posterior edge of the light nuchal collar. The collar is formed by the light throat color which extends upward on the neck as two narrow arms involving the tips of the parietals but not meeting on the mid-line. Top of head dark except for light spots on anterior part of prefrontals, internasals and in temporal region. Other head scales mainly brown but lower portions of rostral, nasals, loreals and supralabials frequently light. Throat and chin light with some brown markings on mental, chin shields and infralabials. Belly immaculate, light (salmon in freshly preserved material). Underside of tail and anal plate light, the former area with a few median brown spots.

Measurements in millimeters: Standard length (snout to anus) in males 197-225.5-251 (225), in females 280-296-312; tail length in males 23.5-28.6-34 (32), in females 22-24-26; head length (snout to tip of parietals) 6-6.4-7 (7.5); head width 3.5-4-4.5 (4).

Remarks: This species was originally described by Bocourt (1883,

p. 540) as part of his *Rhabdosoma maculatum*. His name was based on a female example in the Paris Museum with 144 ventrals, 20 caudals and the lateral stripes more or less broken into spots. Also included within *Rhabdosoma maculatum* by Bocourt was a specimen in the Berlin Museum, a male with 191 ventrals, 29 caudals and the pattern as described above for *gaigeae*. Both of Bocourt's specimens were from "Ecuador."

Boulenger (1894, p. 306, 308) placed *maculatum* in the genus *Atractus* making the name a secondary homonym of Günther's (1858, p. 204) *Isocelis maculata* of Brasil (also an *Atractus*). To further complicate matters Boulenger concluded that Bocourt's female specimen was an example of the eastern South American species *A. badiaus* and included the male snake from the Berlin Museum in his new species *Atractus bocourti* (type locality, Acomayo, Departament Huanuco, Peru). Neither of these allocations can be accepted on the basis of coloration, longitudinal counts and the hemipenes. Bocourt's first specimen (now PM 5986), which is herewith designated the lectotype of his *Rhabdosoma maculatum*, is a distinctive form completely unrelated to *A. badius*. The Berlin Museum snake is unquestionably identical with *A. gaigeae*.

On the basis of data kindly supplied by Mr. J. C. Battersby of the British Museum of Natural History, two males in the collections of that institution appear referrable to *A. gaigeae*. One example (BM 80.12.12.8.13) from Canelos, Napo-Pastaza Province, Ecuador, has 190 ventrals and 36 caudals. The second specimen is from Paitanga, probably in eastern Chimborazo Province, Ecuador, and has 189 ventrals and 35 caudals. In other characters both specimens agree with the description presented above for *A. gaigeae*.

Within the *trilineatus* group *A. gaigeae* most closely resembles *A. collaris* Peracca, 1897 (type locality, Rio Cononaco, Napo-Pastaza Province, Ecuador) in coloration but *collaris* lacks a vertebral stripe and has fewer ventrals, 163 in the male holotype and 175 in a female (SU 12482) from Pevas, Loreto Territory, Peru. The other forms most like *gaigeae* in color pattern differ in the number of longitudinal stripes and series of dorsolateral blotches as well as in having fewer ventrals.

The new species is named in honor of Mrs. Helen Thompson Gaige, long associated with the Museum of Zoology, University of Michigan, who was interested in Ecuadorian members of the genus *Atractus* and surrendered her prior claim so that I might prepare a revisional study.

Atractus dunni, new species

Rhabdosoma maculatum Bocourt, 1883, p. 539, pl. 34, fig. 2 (type locality, Ecuador), a secondary homonym of *Atractus maculatus* (Günther, 1858).

Holotype: PM 5986, a female.

Diagnosis: A species closely related to *A. gaigeae* but distinguished from that form and other Ecuadorian *Atractus* as follows: 1) dorsal scales in 17 rows; 2) loreal between two and three times as long as postnasal; 3) maxillary teeth not known but probably less than 9 in number; 4) ventrals in female lectotype 144, probably about 10 less in males; 5) pattern of five longitudinal stripes and two series of spots.

Lepidosis: Rostral smaller than a prefrontal. Internasals much less

than half as large as a prefrontal. Prefrontals longer than broad. Postoculars two. Temporals 1+2. Supralabials seven, third and fourth in eye. Infralabials five, three meeting a chin shield on each side. Caudals 20. Ventrals plus caudals 164.

Coloration: Dorsal ground color brown with a vertebral dark stripe, two lateral dark stripes, a pair of ventral stripes and a series of dorsolateral dark blotches on each side. Lateral stripes partially broken into discrete spots. A light nuchal collar which does not completely incircle neck, bordered posteriorly by a dark area which is continuous with the lateral stripes. Head mainly brown. Throat, belly, anal plate and underside of tail light.

Measurements in millimeters: Standard length 305; tail length 34.

Remarks: This is a new name for *Rhabdosoma maculatum* Bocourt, 1883, which is preoccupied in *Atractus* by *Isocelis maculata* Günther, 1858. The above description is derived from Bocourt's original account and plate and information kindly provided by M. Jean Guibé of the Paris Museum.

The species is named for Dr. Emmett Reid Dunn of Haverford College at whose suggestion a review of Ecuadorian *Atractus* was undertaken.

Atractus ecuadorensis, new species

Holotype: CM 23529, a male from "Llangate area," Ecuador (probably refers to the Llanganate Range of eastern Tungurahua Province). Collected in March of 1936 by R. W. Chadwick.

Diagnosis: A form similar to *A. dunni* and *A. occidentalis* but differing from them both in coloration and ventral counts. Distinct from all Ecuadorian *Atractus* in: 1) dorsal scales in 17 rows; 2) loreal between two and three times as long as a postnasal; 3) maxillary teeth 8; 4) ventrals in male holotype 144, should be about 10 higher in females; 5) pattern composed of six longitudinal stripes which may be more or less interrupted.

Lepidosis: Rostral smaller than a prefrontal. Internasals much less than half as large as prefrontals. Prefrontals longer than broad. Postoculars two. Temporals 1+2. Supralabials seven, third and fourth in eye. Infralabials five, three meeting each chin shield. Caudals 41. Ventrals plus caudals 185.

Hemipenes: The tail of the type is in poor condition and an accurate description of the penial structures is not possible. The organ appears to be essentially similar to that of *A. gaigeae* and extends to the level of the 12th caudal.

Coloration: Ground color a light brown upon which are superimposed a pair of dorsolateral dark stripes (homologous to the dorsolateral blotches in *A. gaigeae* and *A. dunni*) on the fifth and sixth or sixth and seventh scale rows; a pair of lateral stripes on the third and fourth scale rows; and a third stripe on each side (lateroventral), most prominent anteriorly, running along the margins of the first and second scale rows. All these stripes except the last frequently interrupted and discontinuous. No vertebral or ventral stripes. Dark postnuchal collar area conects the dorsolateral and lateral stripes. Nuchal collar light, reduced, hardly involving tips of parietals. Head dark brown except for light areas on supralabials. Throat and chin light, mental, chin shields and

infralabials heavily mottled with brown. Belly and underside of tail light, with a sprinkling of brown marks which are most concentrated posteriorly.

Measurements in millimeters: Standard length 198; tail length 48; head length 8; head width 4.

Remarks: This form is quite similar to *A. occidentalis* its cognate from western Ecuador. The two forms are unique among the 17 scale rowed Ecuadorian members of the *trilineatus* group in lacking ventral stripes. In addition to differences in ventrals, maxillary dentition and hemipenial features *A. ecuadorensis* is distinct from *A. occidentalis* in lacking a vertebral dark stripe.

Ecuadorensis resembles to a lesser extent *A. dunni.* The two agree closely, when due allowance is made for the sex of the types, in scutellation but the coloration is very different and it is doubtful that the two forms will prove to be identical.

Atractus occidentalis, new species

Holotype: BM 1916.5.23.5, a male from Mindo, Pichincha Province, Ecuador, collected by W. Goodfellow.

Diagnosis: A form showing closest similarity in coloration to *A. ecuadorensis* and in scutellation to *A. dunni* but differing from them and other *Atractus* from Ecuador in: 1) dorsal scales in 17 rows; 2) loreal between two and three times as long as postnasal; 3) maxillary teeth 6; 4) ventrals in male holotype 153; 5) pattern of six irregular longitudinal stripes.

Lepidosis: Rostral smaller than a prefrontal, roughly pentagonal. Internasals much less than half as large as prefrontals; about as broad as long. Prefrontals longer than broad. Postoculars 2-3. Temporals 1+2. Supralabials seven, third and fourth in eye. Infralabials six, four contacting chin shields on each side. Caudals 39. Ventrals plus caudals 192.

Hemipenes: Bifurcate, covered with large spines medially and with very small spines at tip and base. Basal plicae with small hooked spines. Lateral fold or pocket reaching level of fourth caudal, naked. This pocket opposite the sulcus spermaticus which divides at seventh caudal. Hemipenes reaching 18th caudal.

Coloration: Dorsal ground color brown with six irregular longitudinal stripes of darker brown disposed upon it as follows: a pair of lateral stripes on portions of third and fourth or fourth and fifth scale rows; a pair of lateroventral stripes on parts of first and second scale rows; and a dorsolateral pair of stripes corresponding to the dorsolateral blotches of *A. gaigeae* on the sixth and seventh scale rows. No definite ventral stripes although dark markings at tips of ventrals. The light collar on neck not sharply demarcated posteriorly by a dark area, suffused with brown pigment, the two lateral arms narrowly separated by darker brown medially and envolving posterior-lateral portion of parietals. Top of head dark brown, sides lighter except for dark line through eye along upper edges of supralabials. Lower half of supralabials light; throat and chin light with brown spots on anterior infralabials, chin shields and mental. Belly light anteriorly, clouded with dark brown markings most concentrated laterally. At level of about 110th ventral

the clouding comes to overlie most of the venter. Anal brown. Undersides of tail dark brown with a few light punctations.

Measurementst in millimeters: Standard length 265; tail length 56; length of head 9; width of head 5.

Remarks: A. occidentalis appears to be the west Ecuador representative of *A. ecuadorensis* which it resembles in coloration. The new form is well distinguished from *ecuadorensis* by the number of maxillary teeth, ventrals and the hemipenes.

The name *occidentalis* is from Latin meaning western and seems appropriate for an *Atractus* from the west slope of the Ecuadorian Andes.

Atractus orcesi, new species

Holotype: SU 15622, a male from Loreto, Napo-Pastaza Province, Ecuador. Collected in October of 1952 by J. Olalla.

Diagnosis: A species obviously allied to *A. duboisi* Boulenger, 1880, but also showing some affinity with east Ecuadorian 17 scale rowed forms. Well distinguished within the genus in: 1) dorsal scales in 15 rows; 2) loreal between two and three times as long as postnasal; 3) teeth on maxillary 7; 4) ventrals in male type 153, probably about 10 higher in females; 5) pattern of five longitudinal stripes on back and a broad mid-ventral dark stripe.

Lepidosis: Rostral smaller than a prefrontal, almost triangular. Internasals much less than half as large as prefrontal; a little broader than long. Prefrontals longer than broad. Postoculars two. Temporals 1+2. Supralabials seven, third and fourth in eye. Infralabials six, three meeting a chin shield on each side. Caudals 32. Ventrals plus caudals 185.

Hemipenes: Bifurcate at tip, covered with moderate spines of almost uniform size. Basal plicae small, surmounted by spines which gradually blend into spines on body of organ. Lateral fold or naked pocket opposite sulcus spermaticus, extending to fifth caudal. Sulcus divided at seventh caudal. Hemipenes reaching to level of 12th caudal.

Coloration: Dorsal ground color brown with a series of dark longitudinal stripes: a single irregular mid-dorsal stripe, a pair of lateral stripes on upper half of second and lower portion of third scale rows and a pair of ventral stripes on tips of ventrals and lower edges of first scale row. A broad light color on neck, demarcated by light and dark brown areas posteriorly. One dark area continuous with lateral stripes. Light collar complete, not divided by brown mid-dorsally, occupying most of parietals. Upper and lateral head shields dark brown with a few scattered light flecks, except for lower two-thirds of supralabials which are light. A more or less prominent postocular stripe from postoculars to last supralabial. Chin and throat light except for some brownish areas. Belly light with a broad median dark stripe running the length of the body and two ventral stripes along edges of ventrals. On some ventral scutes brown mottling connects the mid-ventral stripe with the ventral stripes along edges of the ventral plates. Anal plate dark brown with light posterior margin. Underside of tail almost uniform brown with a few light flecks.

Measurements in millimeters: Standard length 269; tail length 38.5; head length 8; head width 4.

Remarks: This form is very close to *A. duboisi* Boulenger, 1880, originally described from the Andes of Ecuador on the basis of a male with 150 ventrals and 32 caudals. A second specimen of *duboisi* (EP 611) from Sucua, Santiago-Zamora Province, Ecuador, is a female with 157 ventrals and 18 caudals. The specimen from Intac, Imbabura Province, Ecuador, on the western slopes of the Andes referred by Boulenger (1894, p. 310) to *duboisi* is a young female with 172 ventrals and 16 caudals and obviously cannot be allocated with either *duboisi* or *orcesi* both east Ecuadorian forms. The Intac specimen probably represents an undescribed species of the *trilineatus* group.

A. orcesi appears to be the lowland cognate of *A. duboisi* of the east Andian slopes. The two forms are distinguished by differences in ventral counts, number of maxillary teeth, number of infralabials in contact with the chin shields and number of supralabials. In addition *A. orcesi* retains a vertebral dark stripe and a pair of lateral stripes which are lacking in *duboisi.* The dark mid-ventral stripe is also broader in *orcesi* than in the montane form. Although most of these differences are trivial and subject to some variation in other *Atractus* populations and while few examples are available, it still seems worthwhile to distinguish between the two forms. The distributional pattern with *orcesi* in the lowlands and *duboisi* at higher altitudes further justifies the concept of two distinct forms.

In the type of hemipenes *orcesi* is similar to *A. occipitoalbus* Jan, 1862, a uniformly black, 15 scale rowed form from eastern Ecuador. It is quite possible that these forms are related but *occipitoalbus* has a lower ventral count and is a slimmer snake than *orcesi* or *dubosi. A. occipitoalbus* and *A. orcesi* occur together at the type locality of the latter species. Superficially *A. ecuadorensis,* a 17 scale rowed species, resembles *A. orcesi* and *A. duboisi* and it may be that the 15 scale rowed forms are derived from *ecuadorensis* or some other of the striped, species having 17 scale rows. The relationship does not appear to be particularly close between *orcesi* and any other *Atractus* except *duboisi.*

This species is named for Dr. Gustavo Orcés V. of the Escuela Politecnica Nacional, Ecuador, through whose efforts many Ecuadorian amphibians and reptiles have been added to the collections of the Natural History Museum of Stanford University and who presented the type specimen of the new species to us.

A KEY TO THE STRIPED MEMBERS OF THE *ATRACTUS TRILINEATUS* GROUP KNOWN FROM ECUADOR.

1a. Dolsal scales in 17 rows.
  2a. Ventrals plus caudals less than 210 (range 164-196).
    3a. No ventral longitudinal stripes or dorsolateral blotches, although dorsolateral stripes present.
      4a. No vertebral stripe; maxillary teeth 8; hemipenes in males extending to level of 12th caudal ..... *A. ecuadorensis.*
      4b. A vertebral stripe; maxillary teeth 6; hemipenes in males extending to level of 18th caudal..... *A. occidentalis.*
    3b. Ventral longitudinal stripes and dorsolateral blotches present.
      5a. A vertebral stripe present; ventrals plus caudals 164 *A. dunni.*
      5b. No ventral stripe; ventrals plus caudals 194-196.... *A. collaris.*

2b. Ventrals plus caudals 210 or more (range 222-240)..... *A. gaigeae.*

1b. Dorsal scales in 15 rows.

6a. No vertebral or lateral stripes; ventrals plus caudals 175-182; supralabials 8; maxillary teeth 8; four infralabials meet a chin shield on each side..... *A. duboisi.*

6b. Vertebral and lateral stripes present; ventrals plus caudals 185; supralabials 7; maxillary teeth 7; three infralabials contact a chin shield on each side..... *A. orcesi.*

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